Amana®
Heating ▪ Air Conditioning
A higher standard of comfort

HANG11&12, HALP10 and HAPS27 Kits

High Altitude Conversion Installation Instructions

⚠ WARNING

This conversion kit must be installed by a qualified agency in accordance with the manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. If the information in these instructions is not followed exactly, a fire, explosion or production of carbon monoxide may result causing property damage, personal injury or loss of life. The qualified service agency performing this work assumes responsibility for the proper conversion of this appliance with this kit.

KIT CONTENTS:

HANG11/12 (High Altitude Natural Gas) - Installation instructions, natural gas orifices, wire ties.

HALP10 (High Altitude Propane Gas) - Installation instructions, propane orifices, gas valve conversion kits with instructions, conversion rating plate, conversion date certificate, wire ties, and screen/turbulator removal warning tag.

HAPS27 (High Altitude Pressure Switch) - Installation instructions, pressure switch.

IMPORTANT NOTE: These kits are approved for use on Amana furnace models listed on the following page only. These models are part of the family of 40 inch tall, 90 percent, condensing furnaces.

THE INSTALLATION AND SERVICING OF THIS EQUIPMENT SHOULD BE PERFORMED ONLY BY QUALIFIED, EXPERIENCED TECHNICIANS.

THIS KIT IS NOT INTENDED FOR USE IN CANADA. THE AMANA 90% FURNACES ARE CGA CERTIFIED TO 4500 FEET ONLY.

⚠ RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION.

ATTENTION INSTALLING PERSONNEL:

As a professional installer you have an obligation to know the product better than the customer. This includes all safety precautions and related items.

Prior to actual installation, thoroughly familiarize yourself with this Instruction Manual. Pay special attention to all safety warnings. Often during installation or repair it is possible to place yourself in a position which is more hazardous than when the unit is in operation.

Remember, it is your responsibility to install the product safely and to know it well enough to be able to instruct a customer in its safe use.

Safety is a matter of common sense...a matter of thinking before acting. Most dealers have a list of specific good safety practices...follow them.

The precautions listed in this Installation Manual should not supersede existing practices but should be considered as supplemental information.

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Amana
Fayetteville, TN 37334

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I. Description

These kits are required when installing Amana Air Command 90 SSE furnaces above their maximum (as shipped) rated altitudes (Table 1). Above rated altitude, a derating of the appliance must be followed since the CFM moved by the induced draft blower remains almost constant while the pounds of oxygen in that air is reduced as the altitude increases. If this procedure is not followed and the fuel input is not reduced, combustion can be inefficient, incomplete, or possibly result in premature failure of the heat exchanger due to an excessive temperature rise.

Furnace Model	Rated Altitude without Change
GUCA	Up To 7000 Feet
GCCA	

Table 1
Altitude Rating

Furnace Model	Altitude Feet	Nat. Gas Derate	HAPS27 (-0.16" WC)
GUCA and GCCA	7001-9000 ft	15.3 ± 4%	X
	9001-11,000 ft	32.1 ± 4%	X

Table 2
Pressure Switch Kits

The orifices in the high altitude kits have been selected as a result of testing with the American Gas Association. They will provide appropriate derating at altitudes above rated altitudes shown in Table 1. The selection is based on non-derated gas (about 1000 BTU/Ft ^{3} for natural gas, and 2500 BTU/Ft ^{3} for propane gas). If your gas supply has been derated for the altitude, contact your gas supplier for orifice sizing.

Do not derate by adjusting the manifold pressure to a lower pressure setting other than what is specified on the furnace nameplate. A lower air density in combination with a lower manifold pressure at the burner orifice will prohibit the orifice from aspirating the proper amount of air into the burner. This can cause incomplete combustion of the gas, flashback, and/or possible yellow tipping.

In addition to using smaller orifices to reduce the fuel input, a different pressure switch must be used at altitudes above the rated altitudes shown in Table 1. A high altitude pressure switch is required as a result of the reduction in air density. This change is required regardless of the heat content of the fuel used.

II. HANG11 &12, HALP10 Orifice Installation

CAUTION

To avoid the risk of fire, property damage, or personal injury, shut off gas supply first, then disconnect the electrical supply before proceeding with conversion.

1. Remove the Gas Manifold

   Cut the wire ties securing the wire harness to the manifold. Disconnect low voltage wires from gas valve, and remove the four mounting screws (See Figure 1).

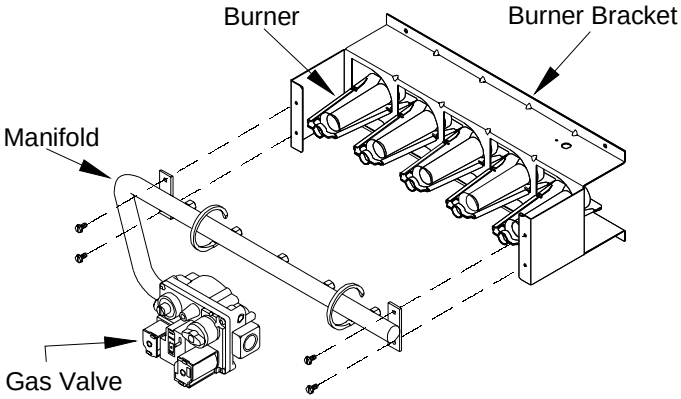

Figure1
Gas Manifold Removal

2. Replace Gas Orifice

   a. Remove the standard altitude, natural gas orifices (Figure 2 & 3) and replace with orifices from the appropriate kit. Kit usage depends on an installation's gas usage (natural or propane) and altitude. Refer to Table 3 or 4 for the appropriate kit requirements.

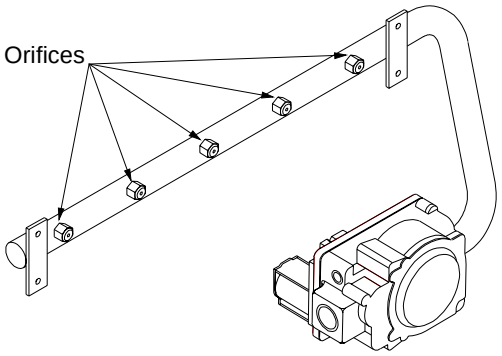

Figure 2
Replacing Gas Orifices

Figure 3
Orifices

Furnace Model	Kit Number	Altitude (Feet)	Orifice
GUCA GCCA	HANG11	7001-9000	#44
GUCA GCCA	HANG12	9001-11,000	#45

NOTE: Units Installed in Canada are certified to 4500 feet only, therefore these kits are not applicable in Canada.

Table 3
Natural Gas Orifice Kits*

* This table assumes non-derated natural gas (about 1000 BTU/Ft^3). If your gas supply has been derated for the altitude, contact your gas supplier for orifice sizing.

Furnace Model	Kit Number	Altitude (Feet)	Orifice
GUCA GCCA	HALP10	7001-11,000	#56

NOTE: Units Installed in Canada are certified to 4500 feet only, therefore these kits are not applicable in Canada.

Table 4
Propane Gas Orifice Kits

b. Tighten orifices with a box-end wrench. Do not use a socket wrench, as it could damage the orifices. Do not overtighten. Do not cross thread.

c. Reinstall the gas manifold to burner bracket assembly using screws removed in step 1. Make certain the orifices are inserted in each burner and that each burner remains properly seated in the burner bracket.

d. Connect low voltage gas valve wires to gas valve. Refer to wiring diagram for proper connection.

e. Wire tie wiring harness to manifold. Make certain wires do not interfere with gas flow from orifices or through burners, or contact any hot surfaces.

NOTE: If converting to propane gas, see PROPANE GAS CONVERSION section for additional instructions.

III. HAPS27 Pressure Switch Installation

WARNING

To avoid death or personal injury due to electrical shock, disconnect the electrical supply to the furnace before installing this kit or performing any service.

1. Shut off gas and disconnect power supply to furnace.
2. Locate the induced draft blower pressure switch.

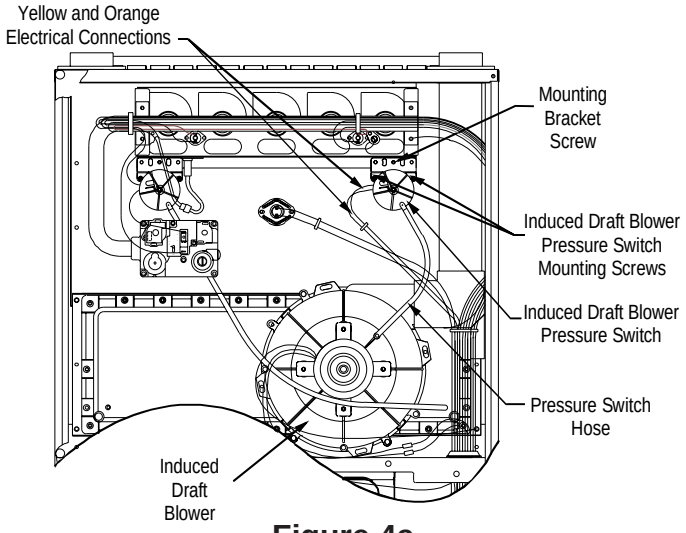
Yellow and Orange Electrical Connections
Mounting Bracket Screw
Induced Draft Blower Pressure Switch Mounting Screws
Induced Draft Blower Pressure Switch
Pressure Switch Hose
Induced Draft Blower

Figure 4a
Induced Draft Blower Pressure Switch Location (GUCA)

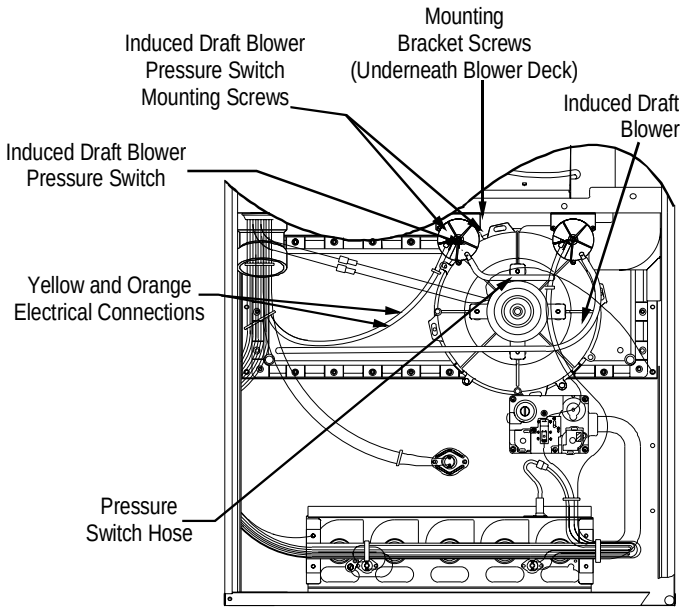
Induced Draft Blower Pressure Switch Mounting Screws
Mounting Bracket Screws (Underneath Blower Deck)
Induced Draft Blower
Induced Draft Blower Pressure Switch
Yellow and Orange Electrical Connections
Pressure Switch Hose

Figure 4b
Induced Draft Blower Pressure Switch Location (GCCA)

CAUTION

To avoid personal injury or property damage due to fire, make certain all wires disconnected from the pressure switch during this procedure are properly reconnected.

3. Disconnect the pressure switch hose from the pressure switch.
4. Disconnect the yellow and orange wires from pressure switch.
5. Remove pressure switch.

   Upflow (GUCA) models (Figure 4a):

   Remove pressure switch mounting bracket screw securing pressure switch and mounting bracket to partition panel.

   Counterflow (GCCA) models (Figure 4b):

   Remove mounting bracket screws securing pressure switch and mounting bracket to blower deck.
6. Remove screws from mounting bracket and transfer the bracket to the HAPS27 pressure switch. Be sure to maintain the same orientation as on the standard altitude switch.
7. Install the HAPS27 pressure switch using screw(s) removed in step 5.
8. Connect the yellow and orange wires to the HAPS 27 pressure switch.
9. Reconnect the pressure switch hose to new switch.
10. Verify proper furnace operation.

IV. HALP10 Propane Gas Conversion

WARNING

PERSONAL INJURY HAZARD

If your propane gas furnace is installed in a basement, an excavated area or a confined space, we strongly recommend that you contact your propane supplier about installing a warning device that would alert you to a gas leak.

Propane gas is heavier than air and any leaking gas can settle in any low areas or confined spaces.

Propane gas odorant may fade, making the gas undetectable except with a warning device.

An undetected gas leak would create a danger of explosion or fire. If you suspect the presence of gas, follow the instructions on the cover of the furnace installation manual. Failure to do so could result in SERIOUS PERSONAL INJURY OR DEATH.

WARNING

PERSONAL INJURY HAZARD

Iron oxide (rust) can reduce the level of odorant in propane gas. A gas detecting device is the only reliable method to detect a propane gas leak. Contact your propane supplier about installing a gas detecting warning device to alert you in the event that a gas leak should develop.

Failure to detect a propane gas leak could result in an EXPLOSION or FIRE which could cause SERIOUS PERSONAL INJURY OR DEATH.

CAUTION

To prevent unsatisfactory furnace operation, the proper gas conversion kit must be used for each valve. Use the White-Rodgers spring kit only with the White-Rodgers gas valve, Honeywell spring kit only with the Honeywell gas valve and Robertshaw spring kit only with the Robertshaw gas valve. THE SPRING KITS ARE NOT INTERCHANGEABLE.

IMPORTANT: Propane gas is heavier than air and does not vent upward as with natural gas fuels.

1. Replace the gas valve regulator spring with one of the new springs included in this propane gas conversion kit.
   - If the unit is equipped with a *White-Rodgers 36*E gas valve, (Figures 5 & 6), use *Spring Kit #92-0659*.
   - If the unit is equipped with a *Honeywell VR8205* gas valve, (Figure 7), use *Spring Kit #393691*.
   - If the unit is equipped with a *Robertshaw 722*2 gas valve, (Figure 8), use *Spring Kit #54300*.

   In each case, change the regulator spring per instructions included with that particular regulator spring. Discard unused spring kits.
2. Attach the label (found in the spring kit) to the gas valve, indicating propane conversion.
3. Attach conversion data plate, with correct input rating, adjacent to the unit rating plate.
4. Post “conversion date certificate” on or adjacent to the furnace.

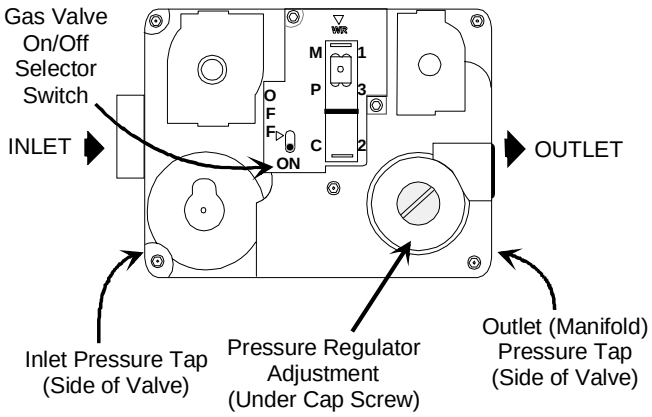

Figure 5
White-Rodgers 36E22 Gas Valve

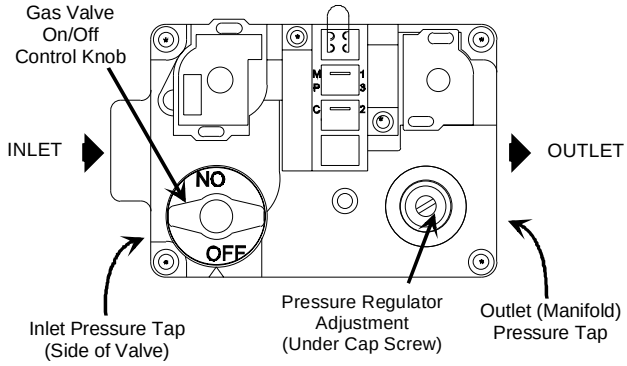

Figure 6
White-Rodgers Model 36E36

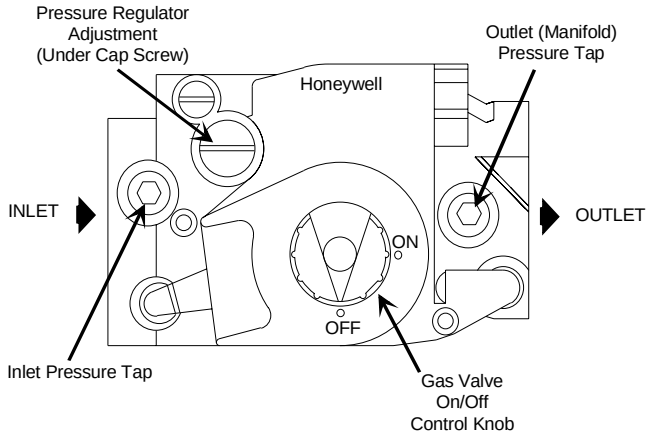

Figure 7
Honeywell VR8205 Gas Valve

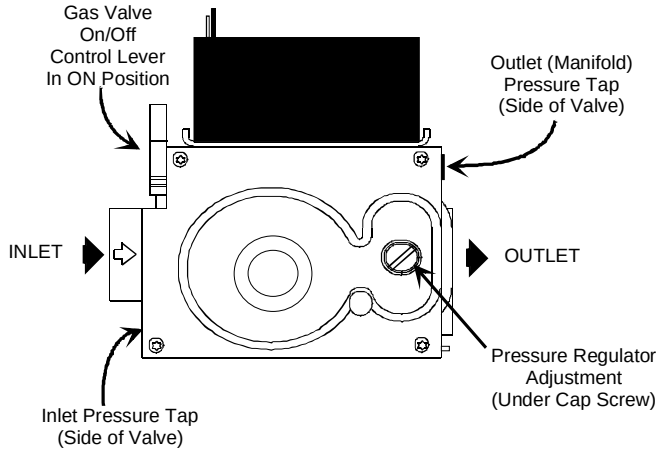

Figure 8
Robertshaw Model 7222

V. Operational Check

The position of the ignitor, relative to the burner is not affected by these conversion procedures.

1. Visually inspect the ignitor for damage. If there is damage, replace the ignitor.

WARNING

To avoid the risk of fire or explosion, do not use a flame to check for leaks.

2. Leak test the orifice threads using a soap solution. If leaks are found, repair before proceeding with operational check of furnace.
3. Start the furnace using the procedures found in the furnace's installation instructions section, "Startup Procedures and Adjustments".
4. Check Gas Supply Pressure

   The line pressure supplied to the gas valve must be within the range specified below. The supply pressure can be measured at the gas valve inlet pressure tap or at a hose fitting installed in the gas piping drip leg. The supply pressure must be measured with the burners operating. To measure the gas supply pressure, use the following procedure.

   a. Turn OFF gas to furnace at the manual gas shutoff valve external to the furnace.

   b. Connect a calibrated water manometer (or appropriate gas pressure gauge) at either the gas valve inlet pressure tap or the gas piping drip leg.

   NOTE: At either location, a hose fitting must be installed prior to making the hose connection.

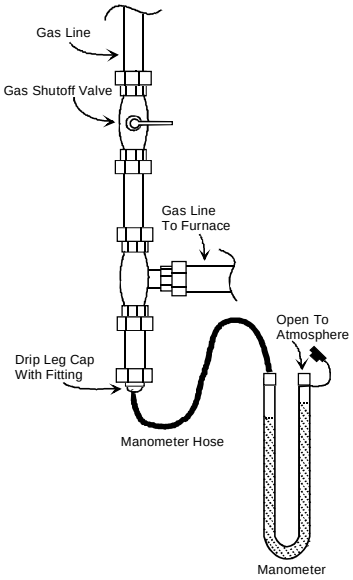

Figure 9
Manometer

c. Turn ON the gas supply and operate the furnace and all other gas consuming appliances on the same gas supply line.

d. Measure furnace gas supply pressure with burners firing. Supply pressure must be within the range specified in the table below.

Inlet Gas Supply Pressure	
Natural Gas	Minimum:5.0" W.C. Maximum :10.0" W.C.
Propane Gas	Minimum:11.0" W.C. Maximum :13.0" W.C.

If supply pressure differs from above, make necessary adjustments to pressure regulator, gas piping size, etc., and/or consult with local gas utility.

e. Turn OFF gas to furnace at the manual shutoff valve and disconnect manometer. Reinstall plug before turning on gas to furnace.

f. Turn OFF any unnecessary gas appliances started in step c.

5. Check Manifold Pressure

Only small variations in gas pressure should be made by adjusting the gas valve pressure regulator. The manifold pressure must be measured with the burners operating. To measure and adjust the manifold pressure, use the following procedure.

a. Turn OFF gas to furnace at the manual gas shutoff valve external to the furnace.

b. Connect a calibrated water manometer (or appropriate gas pressure gauge) at the gas valve outlet pressure tap (refer to gas valve figure in previous section).

c. Turn ON the gas supply and operate the furnace.

d. Measure gas manifold pressure with burners firing. Adjust manifold pressure using the following table.

Manifold Gas Pressure	
Natural Gas	3.5" w.c.
Propane Gas	10.0" w.c.

The final manifold pressure must not vary more than ± 0.3 " w.c. from the above specified pressures. Any necessary major changes in gas flow rate should be made by changing the size of the burner orifice.

e. To adjust the gas valve pressure regulator, remove the regulator cap.

f. Turn the adjustment screw clockwise to increase the pressure, or counterclockwise to decrease the pressure.

g. Securely replace the regulator cap.

h. Turn OFF gas to furnace at the manual shutoff valve and disconnect manometer.

i. Reinstall gas valve outlet pressure tap plug before turning on gas to furnace.

6. Check Gas Input Rate (Natural Gas Only)

The gas input rate to the furnace must never be greater than that specified on the unit rating plate. To measure the gas input using the gas meter, proceed as follows:

a. Turn OFF the gas supply to all other gas-burning appliances except the furnace.

b. While the furnace is operating, time and record one complete revolution of the smallest gas meter dial.

c. Calculate the number of seconds per cubic foot (sec/ ft^3) of gas being delivered to the furnace. If the dial is a one cubic foot dial, divide the number of seconds recorded in step 2 by one. If the dial is a two cubic foot dial, divide the number of seconds recorded in step 2 by two.

d. Calculate the furnace input in BTUs per hour (BTU/ hr). Input equals the sum of the installation's gas heating value and a conversion factor (hours to seconds) divided by the number of seconds per cubic foot. The measured input must not be greater than the input indicated on the unit rating plate.

INPUT CALCULATION EXAMPLE:

Installation's gas heating (HTG) value: 1,000 BTU/ ft^3 (Obtained from gas supplier)

Installation's seconds per cubic foot: 34 sec/ ft^3

Conversion Factor (hours to seconds): 3600 sec/hr

Input = (Htg. value x 3600) ÷ seconds per cubic foot

Input = (1,000 BTU/ft^3 x 3600 sec/hr) ÷ 34 sec/ ft^3

Input = 106,000 BTU/hr

This measured input must agree with the derates for your unit and altitude as indicated in Table 2 on page 2.

Derating Example 1: GUCA115AX50 at 8000 ft.

Sea level input = 115000 BTU/Hr.

From Table 1: Derate at 8000 ft. =15.3±4%

Since we are at the mid point of the elevation range, we use the mid point of the derate; 15.3%.

New Input = 115000 x (1 - .153) = 97,405 BTU/Hr

Derating Example 2: GUCA115AX50 at 7001 ft.

Sea level input = 115000 BTU/Hr.

From Table 1: Derate at 7001 ft. = 15.3±4%

Since we are at the lower end of the elevation range, we use the lower derate: (15.3 - 4) = 11.3%

New Input = 115000 x (1 - .113) = 102,005 BTU/Hr

e. Turn ON gas and relight all other appliances turned off in step 6a. Be certain that all appliances are functioning properly and that all pilot burners are operating.

7. Check The Gas Input - Propane Gas

   Verify the gas input rate by checking that the appropriate orifices have been installed and the manifold pressure has been set as stated in these instructions.

8. Check Burner Flames.

   With the burner compartment door in place, check burner flames through the view port. Flames should be stable, soft and blue, (dust may cause orange tips but they must not be yellow). They should extend directly outward from the burners without curling, floating, or lifting off.

9. Check the normal operating sequence of the ignition system to insure burners light properly.

10. Check Temperature Rise

    Temperature rise must be within the range specified on the unit rating plate. An incorrect temperature rise may result in condensing in or overheating of the heat exchanger. An air flow and temperature rise table is provided in the specification sheet. Determine and adjust temperature rise as follows:

    NOTE: At higher altitudes, the relationship between external static pressure and temperature rise will be different than is shown in the installation instructions, while the relationship between CFM and temperature rise will be approximately the same. Temperature rise must still be within the limits shown on the unit nameplate.

    a. Operate furnace with burners firing for approximately ten minutes. Ensure all registers are open and all duct dampers are in their final (fully or partially open) position.

    b. Place thermometers in the return and supply ducts as close to the furnace as possible. Thermometers must not be influenced by radiant heat by being able to “see” the heat exchanger.

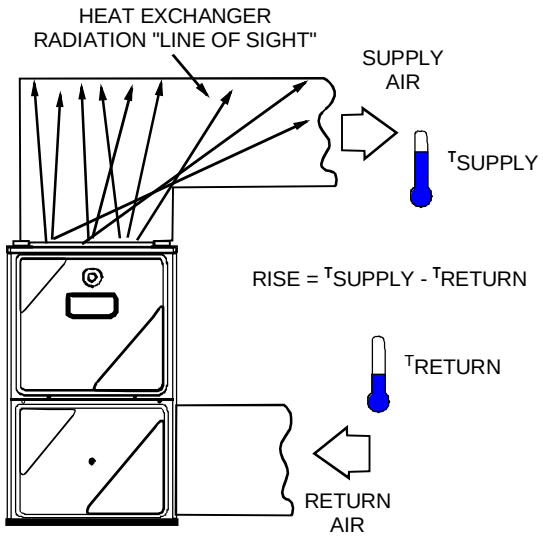

Figure 10
Temperature Rise Measurement

c. Subtract the return air temperature from the supply air temperature to determine the air temperature rise. Allow adequate time for thermometer readings to stabilize.

d. Adjust temperature rise by adjusting the circulator blower speed. Increase blower speed to reduce temperature rise. Decrease blower speed to increase temperature rise.

   If it is necessary to adjust the blower speed, consult the furnace installation manual for details.

VI. Complete The Installation

Refer to the furnace installation manual for all installation details which were not covered in this manual.